

WHAT IS CLAIMED IS:

1. A wireless control system for remotely controlling equipment, comprising:
a transmitter responsive to an input thereto for transmitting a carrier frequency; and
a modulator for modulating the carrier frequency with a frame of bits; and
said frame of bits including a multi-bit ID field for identifying the equipment to be controlled,
5 and a control field for identifying a type of control to be exerted on said equipment, said control field adapted for storing therein bits for interrupting operation of the equipment.
2. The wireless control system of claim 1, further including a forward switch and a reverse switch for providing respective forward signals and reverse signals to be modulated, and further including circuits for generating a stop signal when said forward and reverse switches are deactivated.
3. The wireless control system of claim 2, wherein said transmitter is constructed to transmit a frame of bits during a period of transmission, and wherein said forward, reverse and stop signals occupy the same bit positions of said control field.
4. The wireless control system of claim 1, further including a circuit for storing a multi-bit security code, and a circuit responsive to an input to said transmitter of the forward signal and the reverse signal for transmitting said security code together with one of said forward signal and said reverse signal.
5. The wireless control system of claim 4, further including a manually operable forward switch and a manually operable reverse switch, and a programmed processor responsive to deactivation of either said forward switch or said reverse switch for modulating the control field of said carrier frequency with a stop signal.
6. The wireless control system of claim 1, further including a single on/off press-type switch for activating and deactivating the wireless control system, and further including a visual indicator for indicating an activated or deactivated status of the wireless control system.

7. The wireless control system of claim 6, further including a circuit for blinking the visual indicator in a distinctive manner to visually indicate the status of the wireless control system.

8. The wireless control system of claim 6, further including a timer for timing a period of time in which the on/off switch has been pressed before activating and deactivating the wireless control system.

9. The wireless control system of claim 1, further including a press-type of forward switch, a press-type of reverse switch and a press-type on/off switch, said forward press-type switch associated with circuits for causing the equipment to proceed in a forward direction, said reverse press-type switch associated with circuits for causing the equipment to proceed in a reverse direction, and said on/off switch associated with circuits for applying power and reducing power consumption in the wireless control system.

10. The wireless control system of claim 9, wherein said forward and reverse press-type switches are associated with circuits responsive to release of said forward and reverse switches for producing a stop signal, said stop signal operative to interrupt operation of the equipment.

11. The wireless control system of claim 10, wherein said circuits associated with said forward and reverse switches are responsive to a single release of said forward or reverse switch for transmitting said stop signal multiple times.

12. The wireless control system of claim 1, further including in combination a receiver mounted to the equipment, said receiver including an antenna for receiving signals transmitted from said transmitter, said antenna including a conductive foil strip adhered to an insulator, said conductive foil strip being configured as a dipole antenna.

13. A wireless remote control for use in controlling a winch, comprising:

a hand-held case for housing said wireless remote control;

a programmed processor powered by a battery;

an In switch for coupling a signal to the processor for producing a signal operative for causing

5 a cable to be wound on a reel of the winch;

an Out switch for coupling a signal to said processor for producing a signal operative for causing the cable to be unwound from the reel; and

said processor programmed to be responsive to release of said In and Out switches for transmitting a stop signal to the winch for interrupting movement of the cable.

14. The wireless remote control of claim 13, further including a transmitter for transmitting a security code uniquely related to said winch, and for transmitting a control code indicating whether the cable should be moved in a forward direction, in a reverse direction, or stopped.

15. The wireless remote control of claim 14, further including a transmission format including at least one start bit, a security code and a control code.

16. The wireless remote control of claim 15, wherein said control code includes a multi-bit field for encoding therein a forward signal, a reverse signal or a stop signal.

17. The wireless remote control of claim 16, wherein said multi-bit field is a single n-bit field, and said forward, reverse and stop signals are each n bits long.

18. The wireless remote control of claim 13, further including an On/Off switch for controlling power to the processor of said wireless remote control.

19. The wireless remote control of claim 13, further including a transmitter for producing a carrier frequency, and said forward, reverse and stop signals are modulated on said carrier frequency by pulse width modulation and AM modulation of said carrier frequency.

20. The wireless remote control of claim 19, wherein said forward, reverse and said stop signals constitute n-bit digital signals, and said carrier is modulated with a digital one by transmitting said carrier frequency for a first time period, and said carrier is modulated with a digital zero by transmitting said carrier frequency for a second time period, where said first and second time periods
5 are different.

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21. A wireless remote control for use with a winch mounted on a vehicle, comprising;
a wireless receiver mounted to the vehicle;

a wireless hand-held transmitter for transmitting a coded signal to the receiver, said wireless transmitter having a forward switch, a reverse switch and a power switch for controlling power to the
5 transmitter;

said wireless transmitter provided with a transmission format for the coded signal, said transmission format including a field for a security code, and a field for a control code used for controlling operation of the winch, said wireless transmitter modulating a carrier frequency by modulating the security code and the control code thereon;

10 said control code including a forward code, a reverse code and a stop code;

said transmitter including a programmed processor responsive to activation and deactivation of said forward switch, and responsive to activation and deactivation of said reverse switch, for causing modulation of said carrier frequency, said processor programmed to modulate said carrier frequency with said forward code when said forward switch is activated, said processor programmed to modulate said carrier frequency with said reverse code when said reverse switch is activated, and said processor programmed to modulate said carrier frequency with said stop code when either said forward switch or said reverse switch is deactivated;

a horizontally polarized dipole antenna mounted to the vehicle;

said wireless receiver coupled to said antenna, and said receiver including demodulation circuits
20 for demodulating said control codes and controlling operation of said winch; and

a solenoid arrangement coupled between a battery of the vehicle and the winch, said receiver including a driver circuit for driving the solenoid arrangement in response to the control signals demodulated from the carrier frequency, said solenoid arrangement driven in response to a demodulated forward code for driving current through a motor of said winch to wind a cable on a reel in a forward
25 direction, and said solenoid arrangement driven in response to a demodulated reverse code for driving current through the motor to unwind the cable from the reel, and said solenoid arrangement disconnecting the winch motor from the battery in response to a demodulated stop code.

22. The wireless remote control of claim 21, further including in combination an ATV, and wherein said antenna is mounted to a plastic portion of the ATV.

23. The wireless remote control of claim 22, wherein said antenna comprises a conductive foil antenna mounted horizontally on an undersurface of a plastic headlight housing.

24 The wireless remote control of claim 23, wherein said antenna is mounted to the undersurface of the headlight housing with an adhesive.

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